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EXAMINER
SOLOMON, GARY L

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/604,964

Applicant(s)

SUDA, YASUO

Examiner

Gary L Solomon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-28 and 30-32 is/are rejected.
- 7) ☒ Claim(s) 13 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8, 9, 10</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-32 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-11, 14-27, and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denyer (WO 93/11631) in view of Motta (US 5,565,914).

For claim 1, Denyer teaches an image pickup apparatus comprising:

a first image pickup portion that receives a first wavelength component of the object light, said first image pickup portion including a plurality of photoelectric conversion portions;

(Figure 1 Item 1; Page 9, Lines 20-28)

a second image pickup portion that receives a second wavelength component of the object light, said second image pickup portion including a plurality of photoelectric conversion portions;

(Figure 1 Item 1; Page 9, Lines 20-28)

a first optical system that guides object light to said first image pickup portion; and

(Figure 1 Item 8; Page 9, Lines 20-28; Each respective color array has a its own image sensing surface (3) and a respective lens system associated therewith.)

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a second optical system that guides object light to said second image pickup portion,
(Figure 1 Item 8; Page 9, Lines 20-28; Each respective color array has a its own image sensing surface (3) and a respective lens system associated therewith.).

Denyer fails to teach the limitations wherein, each of said first and second optical systems performs a filtering function whose transmission factor becomes smaller as a distance from an optical axis thereof becomes greater.

However, in analogous art, Motta teaches a filtering function which the transmission factor (**sensitivity**) becomes smaller as distance from the optical axis (**Y**) becomes greater in **Figure 8A**.

Denyer illustrates a filtering arrangement with three mosaic image pickup portions (**Figure 1**). However, Denyer lacks explicit teaching in the transmission factor or spatial resolution.

Seemingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure a filtering pattern in the arrangement of Denyer with the idea of the decreasing transmission factor with distance of Motta in order to increase resolution as suggested by Motta in **Column 1, Lines 54-67**.

For claim 2, Denyer and Motta disclose all the previous limitations of claim 1 and also inherently disclose wherein the first and second wavelength components of the object light are representative wavelengths of light of different spectral distributions, respectively.

(Denyer teaches 3 different wavelength components, which are red, green, and blue. Inherently the different wavelengths are different, thus indicating the color. Inherently, different wavelengths of light are made up of different spectral distributions.)

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For claim 3, Denyer and Motta disclose all the previous limitations of claims 1 and 2, and also disclose wherein one of the different spectral distributions is a spectral distribution including a peak wavelength of a luminosity factor.

(The peak luminosity factor is present in order for there to be a color (red, green, or blue).)

For claim 4, Denyer and Motta disclose all the previous limitations of claim 1, and also disclose wherein one of first and second wavelength components of the object light is included in a spectral distribution including a peak wavelength of a luminosity factor.

(The peak luminosity factor is present in order for there to be a different color of light.)

For claim 5, Denyer and Motta disclose all the previous limitations of claim 1, and Denyer also discloses wherein the first and second wavelength components are two different color components among red, green, and blue.

(Figure 1, Item 1; Page 10, Lines 9-13)

For claim 6, Denyer and Motta disclose all the previous limitations of claim 1, and Denyer also discloses wherein said plurality of optical systems comprise a filter for extracting said different wavelength components, respectively.

(Figure 1; Page 10, Lines 9-13)

For claim 7, Denyer and Motta disclose all the previous limitations of claim 1, and Denyer teaches wherein each of said first and second optical systems comprise a single lens.

(Figure 1, Item 8; Page 9, Line 29 through Page 10, Line 23)

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For claim 8, Denyer and Motta disclose all the previous limitations of claims 1 and 7, and Denyer also teaches wherein said single lens is integrally formed out of glass or resin material.

(Page 10, Lines 1-16)

For claim 9, Denyer and Motta disclose all the previous limitations of claims 1, 7, and 8, and Denyer also teaches a light shielding layer provided between said integrally formed single lenses.

(Page 10, Lines 25-35)

For claim 10, Denyer and Motta disclose all the previous limitations of claim 1, and Denyer also discloses wherein each of said plurality of optical systems comprises a single lens provided with an infrared radiation-cutting filter.

(Page 16, Lines 19-35)

For claim 11, Denyer and Motta disclose all the previous limitations of claim 1, and Denyer also teaches wherein each of the said plurality of optical systems comprises photo chromic glass.

(Page 16, Lines 11-16)

For claim 14, Denyer and Motta disclose all the previous limitations of claim 1, and Denyer also teaches wherein each of the said first and second image pickup portions are integrally formed.

(Page 9, Lines 20-29; Figure 1)

For claim 15, Denyer and Motta disclose all the previous limitations of claim 1, and Denyer also teaches wherein each of the said first and second image pickup portions are formed in a plane shape.

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(Page 16, Lines 17-18)

For claim 16, Denyer and Motta disclose all the previous limitations, and Denyer also teaches the image pickup apparatus further comprising:

a plurality of openings for taking in external light through said first and second optical systems.

(Figure 1; There are 3 openings for taking in light. One for each system (red, green, and blue.)

For claim 17, Denyer teaches an image pickup apparatus comprising:

a first image pickup portion that receives a first wavelength component of the object light, said first image pickup portion including a plurality of photoelectric conversion portions;

(Figure 1 Item 1; Page 9, Lines 20-28)

a second image pickup portion that receives a second wavelength component of the object light, said second image pickup portion including a plurality of photoelectric conversion portions;

(Figure 1 Item 1; Page 9, Lines 20-28)

a first optical system that guides object light to said first image pickup portion; and

(Figure 1 Item 8; Page 9, Lines 20-28; Each respective color array has a its own image sensing surface (3) and a respective lens system associated therewith.)

a second optical system that guides object light to said second image pickup portion,

(Figure 1 Item 8; Page 9, Lines 20-28; Each respective color array has a its own image sensing surface (3) and a respective lens system associated therewith.)

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Denyer fails to teach the limitations wherein, each of said first and second optical systems performs a filtering function whose transmission factor becomes smaller as a distance from an optical axis thereof becomes greater.

However, in analogous art, Motta teaches a filtering function which the transmission factor (**sensitivity**) becomes smaller as distance from the optical axis (**Y**) becomes greater in **Figure 8A**.

Denyer illustrates a filtering arrangement with three mosaic image pickup portions (**Figure 1**). However, Denyer lacks explicit teaching in the transmission factor or spatial resolution.

Seemingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure a filtering pattern in the first optical system arrangement of Denyer with the idea of the decreasing transmission factor with distance of Motta in order to increase resolution as suggested by Motta in **Column 1, Lines 54-67**.

The second optical system of Denyer already does not perform the filtering function which the transmission factor becomes smaller as distance from the optical axis becomes greater.

For claim 18, Denyer and Motta disclose all the previous limitations of claim 17, and also inherently disclose wherein the first and second wavelength components of the object light are representative wavelengths of light of different spectral distributions, respectively.

(Denyer teaches 3 different wavelength components, which are red, green, and blue. Inherently the different wavelengths are different, thus indicating the color. Inherently, different wavelengths of light are made up of different spectral distributions.)

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For claim 19, Denyer and Motta disclose all the previous limitations of claims 17 and 18, and also disclose wherein one of the different spectral distributions is a spectral distribution including a peak wavelength of a luminosity factor.

(The peak luminosity factor is present in order for there to be a color (red, green, or blue).)

For claim 20, Denyer and Motta disclose all the previous limitations of claim 17, and also disclose wherein one of first and second wavelength components of the object light is included in a spectral distribution including a peak wavelength of a luminosity factor.

(The peak luminosity factor is present in order for there to be a different color of light.)

For claim 21, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer also discloses wherein the first and second wavelength components are two different color components among red, green, and blue.

(Figure 1, Item 1; Page 10, Lines 9-13)

For claim 22, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer also discloses wherein said plurality of optical systems comprise a filter for extracting said different wavelength components, respectively.

(Figure 1; Page 10, Lines 9-13)

For claim 23, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer teaches wherein each of said first and second optical systems comprise a single lens.

(Figure 1, Item 8; Page 9, Line 29 through Page 10, Line 23)

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For claim 24, Denyer and Motta disclose all the previous limitations of claims 17 and 23, and Denyer also teaches wherein said single lens is integrally formed out of glass or resin material.

(Page 10, Lines 1-16)

For claim 25, Denyer and Motta disclose all the previous limitations of claims 17, 23, and 24, and Denyer also teaches a light shielding layer provided between said integrally formed single lenses.

(Page 10, Lines 25-35)

For claim 26, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer also discloses wherein each of said plurality of optical systems comprises a single lens provided with an infrared radiation-cutting filter.

(Page 16, Lines 19-35)

For claim 27, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer also teaches wherein each of the said plurality of optical systems comprises photo chromic glass.

(Page 16, Lines 11-16)

For claim 30, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer also teaches wherein each of the said first and second image pickup portions are integrally formed.

(Page 9, Lines 20-29; Figure 1)

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For claim 31, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer also teaches wherein each of the said first and second image pickup portions are formed in a plane shape.

(Page 16, Lines 17-18)

For claim 32, Denyer and Motta disclose all the previous limitations of claim 17, and Denyer also teaches the image pickup apparatus further comprising:

a plurality of openings for taking in external light through said first and second optical systems.

(Figure 1; There are 3 openings for taking in light. One for each system (red, green, and blue.)

4. Claims 12 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denyer (WO 93/11631) in view of Motta (US 5,565,914) in further view of Nakanishi (US 6,157,420).

For claims 12 and 28, Denyer and Motta disclose all the previous limitations, but lack teaching wherein each of the said plurality of optical systems comprises a color purity correction filter.

However, Nakanishi teaches the use of color purity correction filters in **Figures 6A-6C and Column 12, Lines 20-22**. The filters are required color correction of color purity and are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure color purity correction filters with the obvious combination of May and Motts in order to correct and purify colors in an RGB plane as suggested by Nakanishi in **Column 12, Lines 20-22**.

Allowable Subject Matter

5. Claims 13 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to teach the following limitations as recited in claims 13 and 29: when a virtual object distance D [m] is defined as a function of an image pickup angle θ [°] of said first and second optical systems to be $D = 1.4/\tan(\theta/2)$, an interval between the optical axes of said plurality of optical systems is set such that change in an interval between an object image received by one of said plurality of image pickup portions and an object image received by the other one of said plurality of image pickup portions between when an object is at the virtual distance and when the object is at infinity is smaller than a pixel pitch of said image pickup portions multiplied by two.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

8. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L Solomon whose telephone number is (703)-305-4370.

The examiner can normally be reached on Monday - Friday 8:00 AM - 5:00 PM.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (703)-305-4946. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GLS



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